

NASHVILLE DISTRICT HYDROPOWER SYSTEM PLANNING PROGRESS UPDATE

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9 October 2019



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MASTER PLAN COMPONENTS

General Organization:

Purpose and Objectives of the Master Plan

Nashville District Overview and History

Hydropower Rehabilitation Program and History

Program Authorization and Funding (both Section 212 & Appropriated)

20 Year Master Program Plan

5 Year Program Detailed Plan

Hydropower Asset Management Program

LRN Hydropower Program Statistics

Individual Power Plan Development Plans

Communication Objectives:

Provide information on the past, present and future of the LRN Hydropower Rehabilitation Program.

The Master Plan will be the document used for both appropriated and Section 212 funding requests.

Activities:

Rough draft of the report has been developed.

A spreadsheet documenting the status of completion for all projects has been drafted.



MASTER PLAN UPDATE SCHEDULE

October:	Operations update and/or identify HydroAmp and other scores needed for assessment.
November:	Operations input scores and identify priority list (1-n), manual adjustments as needed.
December:	Hold meeting 1st week of December with Ops/EC/PM to review priority list and gain consensus.
January:	<ul style="list-style-type: none">- Programming Month - Section 212 PgM develops funding projections.- Projections feed schedules, outage plan, and budgets.- Review outage plan for manual adjustments.
February:	Compile final draft of Master Plan.
March:	Review and publish as final for customer input.

LRN CY 2020 Hydro Unit Master Outage Schedule (as of 08 October 2019)

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OUTAGE SCHEDULE LEGEND :

SEPA Outage Restriction	O&M Unit Inspection Outages	O&M Specific Work - Maint	Section 212 Program Work	Expected Water Quality Issues	Expected Hydrologic Limitations
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Project	Unit #	Out of Service	Return to Service	Reason Out of Service / Maintenance
Barkley	1	03-Aug-20	27-Sep-20	Transformer Installation
Barkley	2	16-Mar-20	29-Mar-20	Complete Unit Inspection
Barkley	2	03-Aug-20	27-Sep-20	Transformer Installation
Barkley	3	28-Sep-20	22-Nov-20	Transformer Installation
Barkley	4	20-Apr-20	03-May-20	Complete Unit Inspection
Barkley	4	28-Sep-20	22-Nov-20	Transformer Installation
Barkley	Plant	N/A	N/A	Powerhouse Roof Replacement
Barkley	Plant	N/A	N/A	SCADA Installation
Center Hill	1	01-Jan-20	02-Aug-20	Turbine Generator Rehab
Center Hill	1	23-Nov-20	13-Dec-20	Headworks - Intake Gate Hoist Machinery
Center Hill	2	14-Dec-20	31-Dec-20	Headworks - Intake Gate Hoist Machinery
Center Hill	3	01-Jan-20	03-May-20	Turbine Generator Rehab
Center Hill	Plant	N/A	N/A	HVAC System Modifications
Cheatham	1	21-Sep-20	04-Oct-20	Complete Unit Inspection
Cheatham	2	04-Mar-20	10-Mar-20	Partial Unit Inspection
Cheatham	Plant	N/A	N/A	Forebay Debris Removal - Regional Fleet
Cordell Hull	1	07-Sep-20	20-Sep-20	Complete Unit Inspection
Cordell Hull	2	06-Apr-20	12-Apr-20	Partial Unit Inspection
Dale Hollow	1	24-Feb-20	16-Mar-20	Headworks - Intake Gate Hoist Machinery
Dale Hollow	1	10-Aug-20	22-Nov-20	Dissolved Oxygen Levels - NM / 2 Units Max
Dale Hollow	2	16-Mar-20	05-Apr-20	Headworks - Intake Gate Hoist Machinery
Dale Hollow	2	28-Sep-20	11-Oct-20	Complete Unit Inspection
Dale Hollow	3	23-Mar-20	29-Mar-20	Partial Unit Inspection
Dale Hollow	3	06-Apr-20	26-Apr-20	Headworks - Intake Gate Hoist Machinery
Dale Hollow	Plant	N/A	N/A	Cable Tray Replacement

Project	Unit #	Out of Service	Return to Service	Reason Out of Service / Maintenance
J. Percy Priest	Plant	18-May-20	02-Aug-20	Water Quality - No Generation
J. Percy Priest	Plant	N/A	N/A	Arc Flash Hazard Mitigation
J. Percy Priest	Plant	03-Aug-20	22-Nov-20	Expedited Hydrologic Limitations
Old Hickory	3	04-May-20	17-May-20	Complete Unit Inspection
Old Hickory	4	01-Jan-20	24-May-20	Turbine Generator Repair - Bushing Replacement
Old Hickory	Plant	N/A	N/A	Conduit & Cable Replacement
Wolf Creek	1	29-Jun-20	19-Jul-20	Headworks - Intake Gate Hoist Machinery
Wolf Creek	2	07-Sep-20	22-Nov-20	Dissolved Oxygen Levels - NMT 3 Units Max
Wolf Creek	2	30-Mar-20	05-Apr-20	Partial Unit Inspection
Wolf Creek	2	20-Jul-20	09-Aug-20	Headworks - Intake Gate Hoist Machinery
Wolf Creek	4	07-Sep-20	14-Sep-20	Dissolved Oxygen Levels - NMT 3 Units Max
Wolf Creek	4	19-Oct-20	22-Nov-20	Dissolved Oxygen Levels - NMT 3 Units Max
Wolf Creek	3	02-Mar-20	15-Mar-20	Complete Unit Inspection
Wolf Creek	3	10-Aug-20	06-Sep-20	Headworks - Intake Gate Hoist Machinery
Wolf Creek	6	14-Sep-20	22-Nov-20	Dissolved Oxygen Levels - NMT 3 Units Max
Wolf Creek	4	14-Sep-20	18-Oct-20	Headworks - Intake Gate Hoist Machinery
Wolf Creek	5	18-May-20	24-May-20	Partial Unit Inspection
Wolf Creek	5	17-Aug-20	13-Sep-20	Headworks - Intake Gate Hoist Machinery
Wolf Creek	6	20-Apr-20	03-May-20	Complete Unit Inspection
Wolf Creek	6	28-Sep-20	25-Oct-20	Headworks - Intake Gate Hoist Machinery
Wolf Creek	Plant	N/A	N/A	Monitor Repairs
System Wide	Plant	N/A	N/A	Security System Upgrades
System Wide	Plant	N/A	N/A	SCADA Replacement
SEPA Restriction	All	01-Jun-20	31-Aug-20	SEPA Oupage Restriction Period

LRN HYDROPOWER O&M MAINTENANCE UPDATE

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CENTER HILL TRUNNION PIN AND SEALS REPLACEMENT / SPILLWAY ELEC/MECH REPAIR

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Scope

- Replace the trunnion pin for spillway gate 7
- Replace J-Seals on all spillway gates
- Add metal ladders to each pier to allow for inspection and maintenance of trunnion pins
- Rehabilitation for the spillway gate machinery for each gate



Total Project Cost

- \$7.2 million
 - \$5.7 million for the Spillway Gate Machinery
 - \$1.5 million for the Trunnion Pin / J-Seals

Progress

- Machinery work completed on Gates 6 thru 8.
- Working on Gates 2 thru 5.



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BARKLEY TRASH SCREEN



Scope

- To replace the existing trash screens which have holes and gaps allowing large debris to enter scroll case and damage turbine

Total Project Cost

- \$3.53 Million

Progress

- Contract has been awarded at \$2.18 Million.
- Sections currently arriving on site.
- \$1.346 for installation not currently funded.





SECURITY SYSTEM UPGRADE



Scope

- Security systems are being replaced at Barkley, Center Hill, Cheatham, Cordell Hull, Dale Hollow, J.P. Priest, and Old Hickory.

Total Project Cost

- \$3.5 million (Joint)
- \$1.2 million (Hydro portion)

Progress

- Performance verification tests at Cheatham, J.P. Priest and Old Hickory in October.
Currently installing equipment at Cordell Hull.





SCADA REPLACEMENT AT CHE/P, JPP/P, CEN/P, DAL/P, LAU/P & BARKLEY TO REMOTE CAPABLE

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Scope

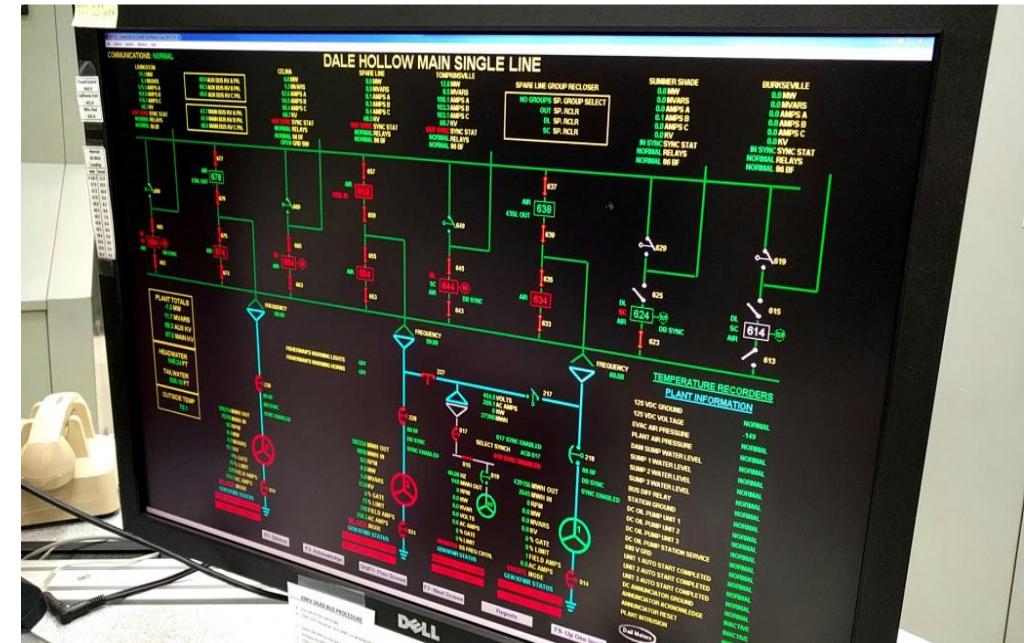
- To replace the five existing SCADA systems (Cheatham, J.P. Priest, Center Hill, Dale Hollow, Laurel), Also converting Barkley to being capable of remote operation.

Total Project Cost

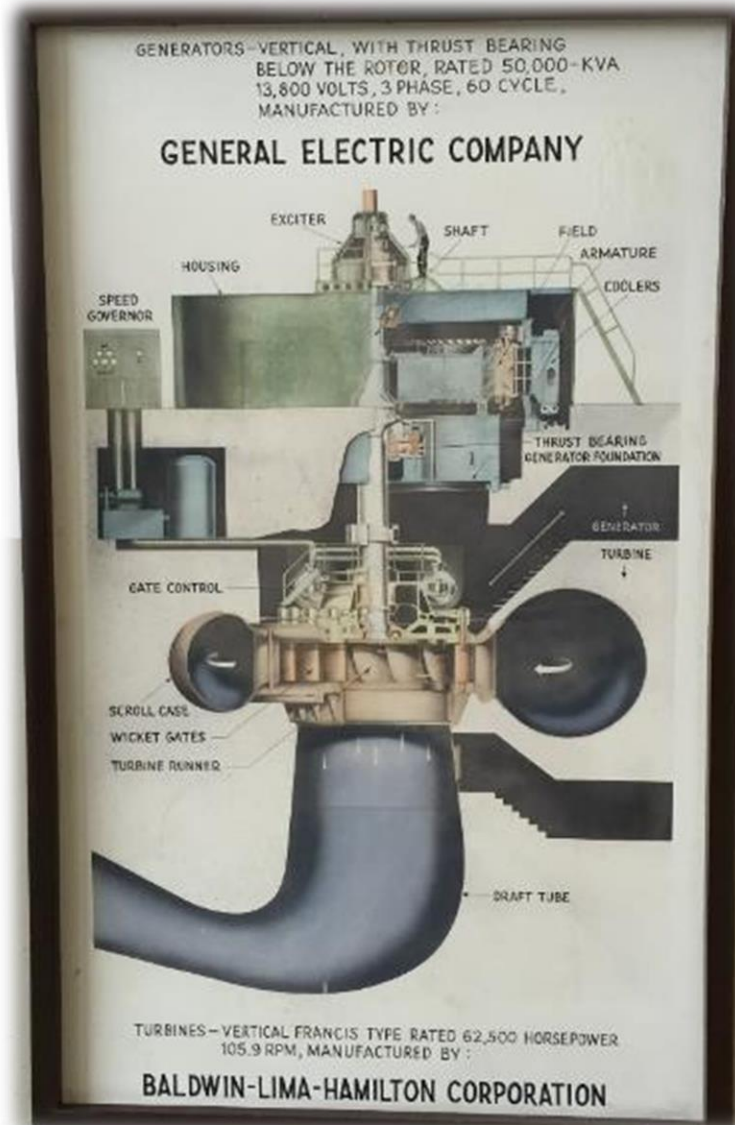
- \$3.9 Million. \$2.645 million (includes 127K for Barkley) for contract with remainder for engineering (including design) and installation.

Progress

- Contract awarded to HSQ Technology. Installation at Old Hickory and Cordell Hull (master plants) beginning in January 2020.



QUESTIONS?



HYDROPOWER OPTIMIZATION INITIATIVE

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OPERATIONS DIVISION – HYDROPOWER OPTIMIZATION INITIATIVE

Great Lakes &
Ohio River Division

Events:

- Federal Hydropower Summit leading to analysis and pursuit of methods to increase efficiency in power production
- Initiated a PDT in order to develop long-term Hydropower Optimization Strategy

Communication Objectives:

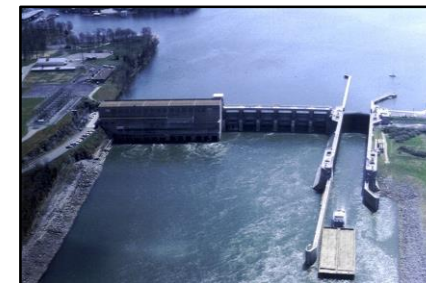
- Optimize return on investment into hydropower operations, increasing reliability, and responsibly stewarding jobs and resources
- Maintain transparency between USACE leadership, employees, and key stake holders in the region

Activities:

- Conducted site visits and personnel meetings at Cordell Hull, Old Hickory, Barkley, Dale Hollow, Wolf Creek
- TVA HQ's hosted us twice to share lessons learned and their best practices
- Initiated PDT Activity on 19 September 2019
- Initial objective is to achieve remote capability at all plants within district, before transitioning to remote control from a single location in the Nashville metropolitan area
- Expected project time horizon of ~10-years

Key Take-Away:

- Nashville District will pursue innovative ways to increase efficiency and reliability of the renewable energy resource that hydropower provides to SEPA



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